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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/364,786	07/30/1999	Radhika Thekkath	0077.20	9876

56074 7590 09/19/2006

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EXAMINER	
AMINI, JAVID A	

ART UNIT	PAPER NUMBER
2628	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/364,786	THEKKATH ET AL.	
	Examiner	Art Unit	
	Javid A. Amini	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19 and 40-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/10/2006 has been entered.

Response to Arguments

Applicant's arguments filed 7/10/2006 have been fully considered but they are not persuasive.

Applicant on page 10 at second paragraph discloses the claim invention relates to an expanded instruction set that facilitates 3D graphics processing. Applicant refers the expanded instruction to a CABS instruction.

Examiner's reply: Heinrich discloses that the floating-point magnitude compare instruction is a CABS instruction. (See p.171, B-9, B-10, and B-19).

Applicant on page 11 argues that the reference Koss does not discloses using "a floating point magnitude compare instruction".

Examiner's reply: Koss in fig. 5 illustrates a floating-point comparator for the clipping preprocessing circuit and using compare instructions. Examiner's comment: Applicant needs to explicitly specify the significant of the claim languages over the prior art.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims **1-19 and 40-48** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claimed invention "transforms" coordinate values into another coordinate values, another word, numbers to a different state or thing. The claimed invention does not produce a useful, concrete and tangible result, because it locates a vertex in a specific volume, which does not specify a physical Practical Application by the comparison. This rejection applies similarly to rejection of claim 11. The rest of claims are depended to the rejected claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-19 and 40-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koss et al (5,720,019; hereinafter Koss) in view of Deering (6,169,554), and further in view of Heinrich ("MIPS R4000 Microprocessor User's Manual).

Regarding claim 1, Koss discloses that the claimed feature of a method for performing computer graphics view volume clipping comparisons to determine if a vertex is located within a

specified view volume, the method comprising: transforming a plurality of coordinates representing the vertex into a plurality of transformed coordinates ["transformed coordinates] (See col. 11 line 17-20, col. 11 line 27-32, col. 11 line 50-60); using a floating point magnitude compare [i.e. "comparator", "floating point comparator", "magnitude comparator"; 206,208,213] instruction to determine an absolute value of at least one of the plurality of transformed coordinates and an absolute value that represents, for each respective at least one transformed coordinate, opposing view volume edges in the specified view volume in a dimension corresponding to the respective at least one transformed coordinate, and perform a magnitude comparison between the absolute value of each of the at least one of the plurality of transformed coordinates and the absolute value of the corresponding view volume edges, wherein comparison results for at least two view volume edges are obtained. (See col. 2 line 42, col. 3 line 28-39, Fig 5, Fig 6, col. 8 line 27-col. 9 line 37, col. 11 line 67-col. 12 line 3). In respect to a definition of "A floating-point number", i.e. a digital representation for a number in a certain subset of the rational numbers, and is often used to approximate an arbitrary real number on a computer. Also the definition for the "absolute values" is, as follows: magnitude of a number or other mathematical expression disregarding its sign; thus, the absolute value is positive, whether the original expression is positive or negative. The reference Deering at col. 1, lines 45-46 under the related art teaches the operations may be performed in either fixed or floating-point math. Deering at col. 15, lines 14-23 teaches the comparisons performed by clip compare unit do not take into account the sign value (bit 31) of the coordinate value stored in register. While the values conveyed to combinatorial logic block by clip compare unit then indicate whether the absolute value of the coordinate is greater than the value of W (indicating that the coordinate is

outside of regular or guard band clipping space), the values do not indicate in which direction (positive or negative) the value is to be clipped. Koss at col. 2, line 42 teaches a comparator can be a floating-point comparator. Also Koss in fig. 5 illustrates a block diagram of a floating-point comparator for the clipping.

Koss does not specifically disclose that performing a magnitude comparison of absolute values. However, such limitation is shown in the teaching of Deering. [i.e. comparing [i.e. "clip comparator unit"; 610] objects with boundaries via use of absolute values. [i.e. "transformed W value" in register 604, "coordinate value" in register 606] [i.e. "the comparisons performed by clip compare unit 610 do not take into account the sign value of the coordinate value stored in register 606] (See Fig 8, col. 15 line 14-24) It would have been obvious to one skilled in the art to incorporate the teaching of Deering into the teaching of Koss, in order to operating the clipping process efficiently, as such improvement is also advantageously desirable in the teaching of Koss for operating the rendering system with uncomplicated manner.

Also, Koss does not explicitly disclose that utilizing the set of compare **instructions**. However, such limitation is shown in the teaching of Heinrich. ["the floating-point compare (C.fmt.cond) instructions interpret the contents of two FPU registers (fs, ft) in the specified format (fmt) and arithmetically compare them"] (See p.171, Table 6-12, B-19) it would have been obvious to one skilled in the art to incorporate the teaching of Heinrich into the teaching of Koss, in order to allow the processor for directly performing the specific calculations and operations during graphic rasterization, as such improvement [implementing "compare instructions"] is also advantageously desirable in the teaching of Koss for operating the rendering system with optimization.

Regarding claim 2, Koss discloses that each of the at least one of the plurality of transformed coordinates are processed in parallel. (See Fig 3-4, Fig 8-9, col. 2 line 34-51, col. 6 line 66-col. 7 line 17, col. 15 line 56-58)

Regarding claim 3, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that setting a plurality of condition code bits to one or more specific states to indicate results of the magnitude comparison. (See p.159, p.161, p.170; Also See col. 2 line 30-51, col. 8 line 43-col. 9 line 50, col. 11 line 61-col. 12 line 10 in Koss)

Regarding claim 4, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that specifying a compare condition in the floating point magnitude compare instruction. (See p.159, p.161, p.170)

Regarding claim 5, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that setting one of the plurality of condition code bits to indicate true if an associated compare condition is true and setting the one condition code bit to indicate false if associated compare condition is false. (See p.159, p.161, p.170)

Regarding claim 6, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that converting a plurality of fixed point values into a plurality of floating point values using a first convert instruction. (See p.170, B-10)

Regarding claim 7, refer to the discussion for the claim 1 hereinabove; Heinrich further discloses that the first convert instruction is a CVT.PS.PW instruction. (See B-9, B-10)

Regarding claim 8, refer to the discussion for the claim 1 hereinabove, Heinrich further discloses that converting a plurality of floating point values into a plurality of fixed point values using a second convert instruction. (See p.170, B-10, B-21, B-23)

Regarding claim 9, refer to the discussion for the claim 1 hereinabove; Heinrich further discloses that the second convert instruction is a CVT.PS.PW instruction. (See B-9, B-10)

Regarding claim 10, refer to the discussion for the claim 1 hereinabove; Heinrich further discloses that the floating-point magnitude compare instruction is a CABS instruction. (See p.171, B-9, B-10, and B-19).

Regarding claim 11, claim 11 is similar in scope to the claims 1, and thus the rejection to claim 1 hereinabove is also applicable to claim 11.

Regarding claim 12, claim 12 is similar in scope to the claim 3, and thus the rejection to claim 3 hereinabove is also applicable to claim 12.

Regarding claim 13, claim 13 is similar in scope to the claim 4, and thus the rejection to claim 4 hereinabove is also applicable to claim 13.

Regarding claim 14, claim 14 is similar in scope to the claim 5, and thus the rejection to claim 5 hereinabove is also applicable to claim 14.

Regarding claim 15, claim 15 is similar in scope to the claim 6, and thus the rejection to claim 6 hereinabove is also applicable to claim 15.

Regarding claim 16 claim 16 is similar in scope to the claim 7, and thus the rejection to claim 7 hereinabove is also applicable to claim 16.

Regarding claim 17, claim 17 is similar in scope to the claim 8, and thus the rejection to claim 8 hereinabove is also applicable to claim 17.

Regarding claim 18, claim 18 is similar in scope to the claim 9, and thus the rejection to claim 9 hereinabove is also applicable to claim 18.

Regarding claim 19, claim 19 is similar in scope to the claim 10, and thus the rejection to claim 10 hereinabove is also applicable to claim 19.

Regarding claim 40, claim 40 is similar in scope to the claim 29, and thus the rejection to claim 29 hereinabove is also applicable to claim 40.

Regarding claim 41, claim 41 is similar in scope to the claim 29, and thus the rejection to claim 29 hereinabove is also applicable to claim 41.

Regarding claim 42, refer to the claim 1 hereinabove; Heinrich discloses that the floating-point magnitude compare instruction is part of a general-purpose instruction set architecture. (See p.159, p.161, p.170)

Regarding claim 43, refer to the claim 1 hereinabove; Heinrich discloses that the floating-point magnitude compare instruction is part of an application specific extension to a general purpose instruction set architecture. (See p.159, p.161, and p.170)

Regarding claim 44, refer to the claim 1 hereinabove; Deering discloses that the floating-point magnitude compare instruction is executed in a single clock cycle. (See col. 3 line 20-23, col. 6 line 21-24)

Regarding claim 45, claim 45 is similar in scope to the claim 2, and thus the rejection to claim 2 hereinabove is also applicable to claim 45.

Regarding claim 46, claim 46 is similar in scope to the claim 42, and thus the rejection to claim 42 hereinabove is also applicable to claim 46.

Regarding claim 47, claim 47 is similar in scope to the claim 43, and thus the rejection to claim 43 hereinabove is also applicable to claim 47.

Regarding claim 48, claim 48 is similar in scope to the claim 44, and thus the rejection to claim 44 hereinabove is also applicable to claim 48.

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koss et al (5,720,019) in view of Dubey et al (6,298,365), and further in view of Heinrich ("MIPS R4000 Microprocessor User's Manual).

Regarding claim 1, Koss discloses that the claimed feature of a method for performing computer graphics view volume clipping comparisons to determine if a vertex is located within a specified view volume, the method comprising: transforming a plurality of coordinates representing the vertex into a plurality of transformed coordinates ["transformed coordinates] (See col. 11 line 17-20, col. 11 line 27-32, col. 11 line 50-60); using a floating point magnitude compare [i.e. "comparator", "floating point comparator", "magnitude comparator"; 206,208,213] instruction to determine an absolute value of at least one of the plurality of transformed coordinates and an absolute value that represents, for each respective at least one transformed coordinate, opposing view volume edges in the specified view volume in a dimension corresponding to the respective at least one transformed coordinate, and perform a magnitude comparison between the absolute value of each of the at least one of the plurality of transformed coordinates and the absolute value of the corresponding view volume edges, wherein comparison results for at least two view volume edges are obtained. (See col. 2 line 42, col. 3 line 28-39, Fig 5, Fig 6, col. 8 line 27-col. 9 line 37, col. 11 line 67-col. 12 line 3)

Koss does not specifically disclose that performing a magnitude comparison of absolute values. However, such limitation is shown in the teaching of Dubey et al. [" **a single** floating-point bounds comparison"] (See Abstract, col. 1 line 41-60, col. 3 line 35-col. 4 line 24, col. 7

line 1+) It would have been obvious to one skilled in the art to incorporate the teaching of Dubey into the teaching of Koss, in order to provide "a quick and easy (less complex) comparison function within computer instruction set architectures" (See col. 1 line 35-36, col. 1 line 52-60 in Dubey), as such improvement is also advantageously desirable in the teaching of Koss for operating the rendering system with uncomplicated manner.

Also, Koss does not explicitly disclose that utilizing the set of compare **instructions**. However, such limitation is shown in the teaching of Heinrich. ["the floating-point compare (C.fmt.cond) instructions interpret the contents of two FPU registers (fs, ft) in the specified format (fmt) and arithmetically compare them"] (See p.171, Table 6-12, B-19) it would have been obvious to one skilled in the art to incorporate the teaching of Heinrich into the teaching of Koss, in order to allow the processor for directly performing the specific calculations and operations during graphic rasterization, as such improvement [implementing "compare instructions"] is also advantageously desirable in the teaching of Koss for operating the rendering system with optimization.

Regarding claim 11, claim 11 is similar in scope to the claims 1, and thus the rejection to claim 1 hereinabove is also applicable to claim 11.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A. Amini whose telephone number is 571-272-7654. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on 571-272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Javid A Amini
Examiner
Art Unit 2628

J.A.

KEE M. TUNG
SUPERVISORY PATENT EXAMINER